

WHAT IS CLAIMED IS:

1. A projection apparatus which projects a pattern image onto an object so as to detect, by a phase difference scheme, a focus state of a phototaking system or observation system, comprising:

a first projecting system for projecting a first pattern extending in a first direction to a plurality of positions arranged in the first direction and including a central focus detection region on the object; and

a second projecting system for projecting a second pattern extending in a second direction to a plurality of positions arranged in the second direction and including the central focus detection region on the object.

2. An apparatus according to claim 1, wherein a difference is generated between brightness of the pattern image projected by one of said first and second projecting systems and that of the pattern image projected by the other projecting system.

3. An apparatus according to claim 2, wherein said first projecting system and said second projecting system have light sources which have the same characteristics, and

the number of pattern images projected by said one of said first and second projecting systems is made smaller than the number of pattern images projected by said other projecting system so as to make the pattern
5 image projected by said one projecting system brighter than that projected by said other projecting system.

4. An apparatus according to claim 1, wherein
said first projecting system has a projecting
10 optical element having a plurality of projecting optical axes in the first direction, and
said second projecting system has a projecting optical element having a plurality of projecting optical axes in the second direction.

15 5. An apparatus according to claim 4, wherein said projecting optical elements of said first and second projecting systems are lenses.

20 6. An apparatus according to claim 4, wherein said projecting optical elements of said first and second projecting systems are prisms.

25 7. An apparatus according to claim 1, wherein said first projecting system and said second projecting system have light sources which has the same characteristics,

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said first and second projecting systems have identical pattern masks arranged in front of said light sources to form the respective patterns, and projecting optical elements which have the same characteristics and a plurality of projecting optical axes, and

said first and second projecting systems are laid out to be phase-shifted each other by 90° when viewed from a direction of optical axis.

8. An apparatus according to claim 1, wherein the number of pattern images projected by one of said first and second projecting systems is a predetermined number smaller than the number of pattern images projected by the other projecting system.

9. An apparatus according to claim 8, wherein said one projecting system has a synthesizing optical element for synthesizing the plurality of pattern images formed by a projecting optical element of said one optical system into the predetermined number of pattern images and projecting the pattern images.

10. A phototaking apparatus comprising:
a focus detection unit for detecting a focus state of a phototaking system; and
a mounting portion adapted to mount the projection apparatus of claim 1,

wherein said phototaking apparatus detects a focus
state of the phototaking system using a pattern image
projected by the projection apparatus and performs
focus adjusting operation of the phototaking system on
5 the basis of the detection result.

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